



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/854,759	05/14/2001	Michael B. Ball	4589US (99-1151)	8899
24247	7590	12/09/2003	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			HARAN, JOHN T	
			ART UNIT	PAPER NUMBER

1733

DATE MAILED: 12/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/854,759

Applicant(s)

BALL ET AL.

Examiner

John T. Haran

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1,2,4 6-13,15,17-23,25,27-33,35,37-45,47,49-51,53,55-58,60,62,64-67,71-84 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1,2,4,6-13,15,17-23,25,27-33,35,37-45,47,49-51,53,55-58,60,62,64-67 and 71-84 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9/10/03.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This office action is in response to the amendment filed on 10/30/03. The rejection of the claims under 35 USC 112, second paragraph is withdrawn in light of the amendments to the claims.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 9/10/03 has been considered by the examiner.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 2, 4, 6-13, 15, 17-23, 25, 27-33, 35, 37-45, 47, 49-51, 53, 55-56, and 76-84 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claims 1, 12, 23, 33, 45, 51, and 76 contain the limitation "conforming at least a portion of said adhesive of said tape to said bumps to form a substantially planar surface on said backing of said tape". It is entirely unclear how conforming the adhesive to the shape of the bumps forms a planar surface on the backing of the tape. It appears the phrase "to form a substantially planar surface on said backing of said tape" should read - - wherein the backing of said tape has a substantially planar surface after the conforming - -.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 4, 6, 10-13, 15, 17, 21-23, 25, 27, 31-33, 35, 37, 41-45, 47 49, 51, 53, 55, 57, 58, 60, 62, 64, 66, 67, 71-73, 76-79, and 83-84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh (U.S. Patent 6,338,980) in view of Bennett et al (U.S. Patent 6,478,918).

As noted in the previous office action the bumps are considered part of the surface (or front surface) of the wafer.

Satoh discloses a method for manufacturing chip-scale packages and IC chips wherein a wafer is provided with bumps (projecting electrodes) on an active surface of the wafer, the adhering face of an adhesive member, such as a tape, is applied to the active face of the wafer thereby covering and protecting the bumps and the other face is attached to a table (wafer mount) by vacuum attraction (suction), and then the inactive face of the wafer is thinned through grinding (See abstract; Column 3, lines 27-50; and Column 6, lines 10-17). Also as illustrated in Figure 1C the adhesive face of the adhesive member conforms to the shape of the bumps and the nonadhesive face (backing) is a substantially planar surface. Satoh is silent towards the adhesive member having a backing.

Art Unit: 1733

Satoh discloses the adhesive member can have one adhesive face or two adhesive faces and can be a tape or a resin or rubber plate with an adhesive face (Column 10, lines 10-16). One skilled in the art would have readily realized that numerous possibilities exist for obtaining an adhesive member with one adhesive face and one nonadhesive face such as a nonadhesive film, resin plate, or rubber plate that is rendered adhesive on one face while leaving the other face nonadhesive through heating, or an adhesive film that is adhesive on both sides and is provided with a cover film or backing layer on one side to provide a nonadhesive side, or providing a nonadhesive film with an adhesive coating on one side, all of which are well known and conventional methods for obtaining an adhesive member with one adhesive face and one nonadhesive face. One skilled in the art would have readily appreciated that they are all alternate expedients that are all obvious one over the other. Furthermore, it is notoriously well known and conventional that adhesive tapes have a backing, as shown for example in Bennett et al. Bennett et al is cited as an example of a conventional adhesive tape with a backing used in wafer grinding (See abstract). Additionally one skilled in the art would have readily appreciated that the backing would have a planar surface for attachment to the vacuum suction table just like the nonadhesive face of Satoh. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an adhesive tape that has a backing, as is notoriously well known and conventional, that has a planar surface for attachment to the vacuum suction table in the method of Satoh.

Art Unit: 1733

Regarding claim 12, one skilled in the art would have readily appreciated that it is well known and conventional when providing a backing to an adhesive member that either the adhesive is applied to an object first and then the backing is applied or the adhesive is applied to the backing and then the adhesive is applied to an object. The two are alternative expedients and are obvious one over the other. It would have been obvious to one of ordinary skill in the art to provide the adhesive to the active surface of the wafer and then apply the backing in the method of Satoh.

Regarding claim 76, Satoh clearly teaches that the tape contacts between about 10% and about 60% of the surface area of the bumps (See Figure 1C).

Regarding claims 11, 22, 32, and 84 while Satoh teaches thinning through grinding, it is also well known and conventional to thin through chemical-mechanical polishing. It would have been obvious to thin the wafer using the well known and conventional technique of chemical-mechanical polishing in the method of Satoh, as modified above.

7. Claims 7-9, 18-20, 28-30, 38-40, 50, 56, 65, 74-75, and 80-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh (U.S. Patent 6,338,980) in view of Bennett et al (U.S. Patent 6,478,918) as applied above, and further in view of the admitted prior art.

Satoh is silent towards the thickness of the wafer pre and post thinning, but does teach thinning the wafer 100 micrometers (about 4 mil) as an example (Column 8, lines 12-13).

Art Unit: 1733

The admitted prior art teaches that a wafer must be at least 12 mils thick to undergo the bumping process without damaging the wafer (Specification, page 3, paragraph 5).

One skilled in the art would have readily appreciated performing the bumping process to the wafer at the lowest permissible wafer thickness to minimize the amount of wafer material that needs to be thinned and thinning the wafer to the ultimate desired thickness. The ultimate thickness of the wafer is within the purview of one skilled in the art and as taught in both the admitted prior art and Satoh it is desired to minimize the size of the wafer thickness. It would have been obvious to one of ordinary skill in the art at the time the invention was made to bump the wafer surface when it has a thickness of at least 12 mil and to thin it to at least 6 mils in the method of Satoh, as modified above.

Response to Arguments

8. Applicant's arguments filed 10/30/03 have been fully considered but they are not persuasive. As noted above, Satoh teaches having an adhesive face and a nonadhesive face and that there are numerous manners in which to achieve this including the notoriously well known and conventional adhesive tapes with a backing as shown for example in Bennett et al. It is noted that Bennett teaches using such an adhesive tape in a wafer grinding process. It would have been obvious to use an adhesive tape with a backing in the method of Satoh. Furthermore, one skilled in the art would appreciate that the backing would have the same characteristics as the

Art Unit: 1733

nonadhesive surface taught in Satoh, namely a planar surface for attachment to the vacuum suction table.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John T. Haran** whose telephone number is **(703) 305-0052 or (571) 272-1217 as of 12/19/03**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (703) 308-3853. The fax phone

Application/Control Number: 09/854,759

Page 8


Art Unit: 1733

number for the organization where this application or proceeding is assigned is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



John T. Haran



JEFF H. AFTERGUT
PRIMARY EXAMINER
GROUP 1300